The Excavating Engineer

Vol. 19 MARCH 1925 No. 3

Changing the Channel of the Cowlitz River, Washington

Description of Dragline Operation Involving 300,000 Cubic Yards of Excavation by the Longview, Portland & Northern Railroad

WHEN engineers of the Longview, Portland & Northern Railroad were surveying the route of the new railroad, which follows the west bank of the Cowlitz River for thirty miles north from the new city of Longview, Washington, to Ryderwood, center of logging operations of The Long-Bell Lumber Company, they were confronted with a perplexing problem when they reached a big bend in the Cowlitz River about 12 miles north of Longview, opposite the city of Castle Rock.

The Problem

The problem presented itself in the shape of a wide bend in the Cowlitz River, whose banks the route had followed thus far up the valley. To skirt this bend would be a costly piece of work, necessitating much heavy grading, including one cut 103 feet deep, partly in solid rock. It would also have made three long sharp curves necessary, and would have lengthened the line fully one-half mile.

The decision was reached to build the railroad straight across the bend, which meant that a bridge 1100 feet long must be built, then a fill made for several hundred yards across the neck of land formed by the curve of the river, and another bridge 1600 feet long constructed across the river.

The decision to bridge the river presented other problems. The Cowlitz is a treacherous stream, with a reputation for sudden rises in volume at certain periods of the year. During freshet season in the spring of the year it has been known to rise overnight from a placid river to a raging torrent. Furthermore, inasmuch as it traverses a logging country, these rises in volume bring with them much driftwood, debris and logs. At such times it would take more than a pile trestle to be secure against the battering the foundation would be subjected to. On the other hand, to build steel bridges would be as expensive as it would be to build the railroad around the curve.

How It Was Solved

Confronted by these problems, and faced by a need for speed, the engineers decided to span the river with pile bridges and to change the channel of the river, diverting it across the neck of land in such a way that the main current would not strike the bridges. This would make it possible in time to fill in the bridges with dirt, as the new channel was widened, thus effecting a permanent change.

A survey of the land showed that the channel change, while a gigantic earth-moving job, was feasible, and could be accomplished without impeding the progress of the railroad construction. The peninsula or neck of land formed by the curve in the river is approximately 40 acres in area and comparatively flat. At one time the area formed a part of the city site of Castle Rock. Years ago it had been laid out with streets and homesites, but in 1906, during a period of high water, the river broke through and washed the buildings away. Since that time Castle Rock has expanded in the direction opposite the river, and the area had been abandoned as a city site. The engineers saw that it was only necessary to cut a new channel across this neck of land, approximately 2200 feet wide, at the point selected for the cut, thereby causing the river to flow across it instead of making a wide curve around it. The new channel would form a natural course for the river, straightening it out and decreasing its length by approximately one mile.

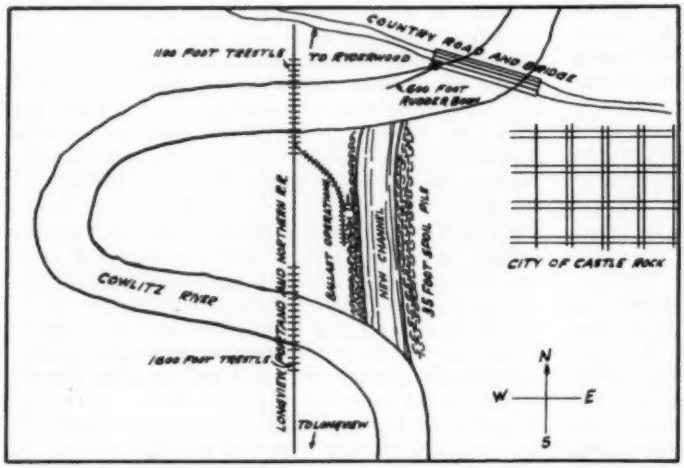
Dragline Operation

Operations were started in September, 1924, when a Bucyrus Class-24 dragline, equipped with a 100-foot boom and four-yard bucket, was moved to the site. This machine had been used on other parts of construction in the building of Longview and the Longview, Portland & Northern Railroad, and had established an enviable record for moving dirt cheaply and quickly. It was transported for 10 miles on a barge up the Cowlitz River, and was

first put to work building the embankment for the railroad. This completed, it was ready to start operations on the channel change.

The Dragline Crosses the Cowlitz River Under Its Own Power

The broad expanse of the Cowlitz River, however, which was 500 feet wide at this point, lay between the dragline and its job. To cross this was the task immediately before this machine. This was accomplished by the dragline building a fill in front of itself as it moved, to form a pathway. Material was taken in the rear and cast in its path. The machine moved through water up to seven feet deep and made the crossing in less than a week.



Sketch Showing Main Features of Site Upon Which New River Channel Was Built

Digging the New Channel

The first step in making the new channel was to cut a strip approximately 75 feet wide and 2200 feet long to an average depth of eight feet below low water. This strip took the form of a gentle curve across the peninsula, approximately 600 feet away from the bridges and the Longview, Portland & Northern right-of-way. The new channel was cut to give a drop of five feet along its distance of 2200 feet, which was the difference in elevation of the water level of the river at the ends of the new channel. It took the big dragline almost six weeks to complete this first strip of the channel.

When it had cut through, and the main current of the river was flowing through the new cut, the machine moved back over its course, but on the opposite side, widening the cut by another 75 feet, making the channel 150 feet wide. In time it will be 500 feet wide in accordance with provisions set down by the United States War Department in giving permission for the channel change. By the middle of December, the dragline, operating on a double ten-hour shift, had moved approximately 250,000 cubic yards of dirt on this project. It will handle in the neighborhood of 300,000 before it is through.

On the first cut all of the dirt excavated was thrown up by the dragline on one side of the new channel, making a big embankment along its entire length. This huge wall of material, composed of gravel and sand, is approximately 35 feet high, and will serve for all time as a protection to Castle Rock against the Cowlitz River. On the return trip, the dragline deposited the excavated material on the opposite side of the channel. This is being used for ballast in constructing the Longview, Portland & Northern Railroad. Spur tracks have been built from the main line of the Longview, Portland & Northern Railroad into the cut, and on these tracks gravel cars are loaded by a Bucyrus 50-B steam shovel. This shovel has been loading an average of 35 cars a day for the past several months, but has been kept from operating at top capacity at all times due to several periods of high water.

Other equipment on the project is a Monighan dragline with a 60-foot boom and a two-yard bucket. This machine will continue the work started by the big Bucyrus after it has widened the channel sufficiently to take care of immediate needs. This work will probably go forward for several months.

When the new channel was opened, the main current of the river turned into the cut as had been anticipated, but in order to deflect the logs and debris into the new channel, and to insure the trestle against any drift which might follow the main course of the river during high water, a sheer boom 600 feet long was placed in the Cowlitz some distance above the opening of the new cut. This boom is in three sections and is of the rudder type, so built that its angle in the stream can be regulated as changing conditions demand. Up to the present time, having been subjected to a period of ordinary high water, it has been found to work in a most satisfactory manner.

A Question

"Niggah, I's goin' to mash yo' nose all ova yo' face; I's going to push dose teeth down yo' throat, and black both yo' eyes, et cetera."

"Say, yo' black man, yo' don't mean 'et cetera,' yo' means 'vice versa'."

Digging Brick Clay with a Large Revolving Shovel

Description of the Chicago Brick Company's Plant at Riverdale, Illinois

ONE need not be equipped with a witch-hazel stick or divining rod to uncover the fact that the brick industry is flourishing. One needs only to sit for a moment in the office of the superintendent of the Chicago Brick Company of Riverdale, Illinois, to learn the truth of this statement.

As a matter of fact, continued activity in the brick industry is not confined to that company alone, for, indeed, the demand for common brick seems to be general throughout Chicago and its surrounding territory. Chicago is experiencing the highest pressure in building demands in history, and our many usually dependable statisticians inform us that the housing shortage in that metropolis is maintaining a lucrative market for this product.

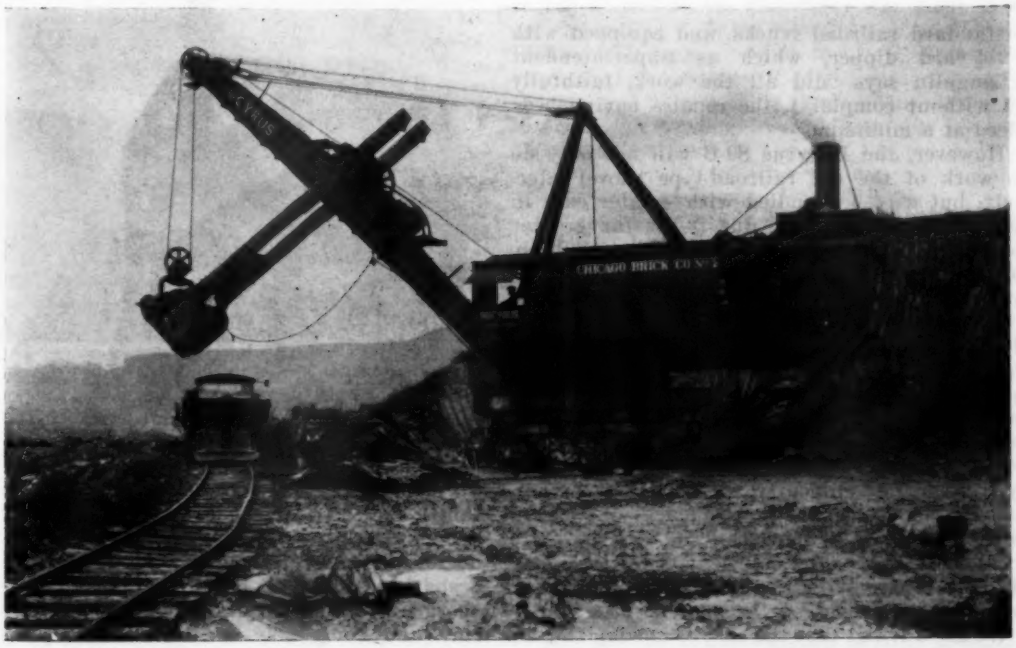
It was for the purpose of meeting the exacting demands of their old customers, and the urgent requests of their new, that the Chicago Brick Company was forced to put into operation a few months ago new equipment that would handle this enormous demand with greater ease and efficiency, and incidentally enable them to turn out a greater quantity and a higher grade of common brick. This new equipment includes a new power house, a new dryer, new storage tanks and a new large revolving steam shovel.

The Property

The property, as mentioned before, is situated near Riverdale, a suburb twenty-five miles south of Chicago on the Illinois Central and Pennsylvania Lines. It consists of 160 acres on the very edge of the little Calumet River, which finds an outlet into the Large Calumet River, 15 miles south of Chicago. The plant has been in operation for over twenty-five years, and a greater portion of the property has been stripped. However, there is still left a little over 60 acres, which, at the present rate of stripping, will allow a vigorous thirty years to the life of the present operations. Assuming that the average depth of stripping remains the same, the property will provide for 32,000,000 brick per acre or approximately 60,000,000 brick a year.

Method of Stripping

Since we are chiefly concerned with development and activities of modern excavating machinery, our story will be devoted for the most part to the excavating phase of the work. A short



The Bucyrus 80-B Shovel Mounted on Equalizing Trucks, Operating in the Pit of the Chicago Brick Company, Riverdale, Illinois.

time ago the company decided to buy in addition to other equipment, a shovel that would handle the work with greater ease and economy. They decided finally upon a Bucyrus 80-B full-revolving shovel on equalizing trucks. It is a 2½-yard machine.

It is interesting to know that the only machine that this company ever had in operation, previous to the date of the purchase of its present modern shovel, was an old 65-Ton Bucyrus which has been in constant service for 23 years. This shovel was purchased in 1901, a railroad-type shovel

Loading the Dump Trains which Transport the Material to the Granulator

on standard railroad trucks, and equipped with a 2½-yard dipper, which as Superintendent McLaughlin says "did all the work, faithfully and without complaint, the repairs having been indeed at a minimum."

However, the Bucyrus 80-B will not only do the work of the old railroad-type shovel effectively, but may be handled with greater ease in their wet and soggy pit, due to its far greater mobility. A glance at the operations will obviously reveal the reason for the choice of a full-revolving type of shovel.

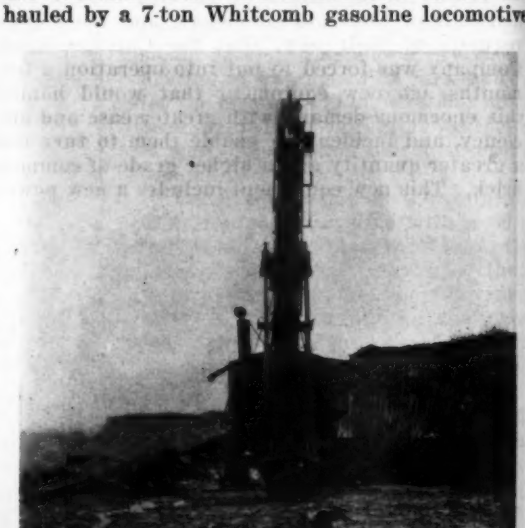
In the first place, the stripping goes to considerable depth below water level, and its proximity to the banks of the Little Calumet River has made the seepage into the pit difficult and troublesome to handle, in spite of the constant use of the two centrifugal pumps, which, with a capacity of 2500 gallons per minute, strive to keep the pit dry. With this difficulty to cope with a full-revolving shovel with a longer reach was highly desirable, since less movement of the shovel is necessary. Its reach is sufficient to take a wider cut, and consequently more material with less moving of the shovel.

We are advised that the cost of moving the old railroad-type shovel from one end of the pit back to the other would sometimes amount to six or seven hundred dollars. With the full-revolving feature of the new machine, it is necessary only to swing around and work in the opposite direction. This movement is at the most a matter of only a few moments. In addition to this feature, it is enabled through its long reach to eliminate a great deal of waste material that collects in the wet pit. This machine can throw this over on the stripped area, while with the railroad-type shovel this was impossible. This, of course, has improved the material sent to the granulator, which incidentally resulted in a superior grade of brick.

Among other advantages of this machine over the old one, it is simpler to operate and more economical, according to the superintendent of the plant.

The Brick-Making Process

The material is delivered by the shovel into dump trains, made up of 4-yard cars, of which 12 are Westerns and 6 are home-made. These are hauled by a 7-ton Whitcomb gasoline locomotive



Another View of the Bucyrus 80-B Shovel

over a narrow gauge industrial track to the foot of the incline.

One car at a time is taken from the train up the incline to the heavy-duty granulator, and at this point the required brick and coal dust are added to the clay. This heavy-duty granulator not only acts as a feeder to the additional clay-preparing equipment but with its revolving shaft operating 45 knives thoroughly granulates the clay and completely incorporates the required brick and coal dust into the pulverized product.

Here, also, a great deal of the foreign matter is eliminated by means of heavy rollers before the mixture is dropped on to the belt conveyor and delivered to the pug-mill.

The pug-mill kneads the clay into a more workable form and thoroughly disintegrates it to a uniform fineness, extracting any stones that may be found in the clay body. This second process of refinement consists of equipment similar to that of the granulator.

From the pug-mill, the clay is then delivered by gravity to the Chambers brick machine which has a capacity of 300,000 brick a day. Here it is forced by means of a revolving screw into the die, and carried on a belt conveyor to the automatic cutter which cuts the clay into standard-size brick. Another conveyor transports the product to the loading crew of 18 men, who remove the brick from the conveyor on to trucks of a capacity of 928 bricks each, which in turn take the green brick to the dryer.

The process of drying is a matter of from 15 to 24 hours, depending upon the amount of moisture in the clay. An average of one pound is taken from each green brick by this process. The dryer is divided into 36 tunnels containing 12 units each, which have a capacity of drying 928 brick at a time, thus affording a total capacity of nearly 400,000 brick.

When the brick is sufficiently dried to be removed from the dryer, it is ready for the kiln, and is transported by the Hadfield-Penfield setting system to the kiln sheds, which are well equipped to afford convenient and advantageous facilities for the storage of the product. Two sheds, one 460 feet long and the other 1500 feet long, provide ample room for the accumulation of over 15,000,000 brick.

The kilns are built in pyramid shape, the loading being done by a Hadfield-Penfield double gantry crane. One and one-quarter million brick are built into one kiln, and the usual method of building is employed. The brick is so arranged as to allow openings of 1 foot x 1½ foot at intervals of 3 feet, through which the firing of the brick may be done. The system of baking is that of using smokeless oil burners under each of these entrances. This baking by fire thoroughly bakes the brick to a point half-way to the top of the kiln, and the heat does not penetrate throughout. When this baking is thorough at the base of the kiln, therefore, steam is turned in which completes the baking at the top of the kiln.

After this process is completed, the brick is stored in the kiln sheds, and delivered by trucks to all parts of Chicago and its vicinity.

In walking about the plant of the Chicago Brick Company one senses the spirit which is behind its progressive organization. The plant is up to date from beginning to end, and at the time of this writing much new equipment is being installed, including a new power plant, a new dryer and a new oil storage tank with a capacity of 500,000 gallons. With the new equipment it

A close-up of one of the dump trains with part of the plant in the background. The locomotive in the foreground is gasoline driven. It is a Whitcomb.

will be possible to utilize all of the waste heat from the power plant in the dryer.

The company has been established for 25 years and is owned by Mr. R. Fitzgerald, Chicago. The main offices of the company are at 1304 First National Bank Building, Chicago.

A Correction

On page 59 of the February issue of *The Excavating Engineer*, the statement was made in the article dealing with the "Building of an Elevated Railroad Underground" by the L .E. Myers Company, that the statement of the total yardage of the job was 25,000 cubic yards. This figure was in error, the total cubic yardage of the job being 350,000 cubic yards.

The Purdue Road School

With a total registration of 433, the Eleventh Annual Purdue Road School, Lafayette, Indiana, exceeded all records, not only in attendance but in interest and practical results.

A wide range of subjects were covered during the week, under such headings as construction, maintenance, drainage, equipment, road laws, and various allied subjects.

The annual road school is under the direction of the School of Civil Engineering and is a part of the Engineering Extension Service of the University.

Announcement has recently been made to the effect that Mitchell D. Follansbee will head the new law firm of Follansbee, Shorey & Schupp, with offices at 137 South La Salle Street, Chicago, Illinois.

Mr. Follansbee has for many years been General Counsel and Chairman of the Executive Committee of the Bucyrus Company.

This new arrangement became effective on the first of March.

Grading the Largest Freight Depot in Europe

An Interesting Description of Classification Yard Excavation in Belgium with American Shovels

AT Wilmarsdonck, near Antwerp, Belgium, Messrs. De Moor Freres, the well-known Belgian contractors, have in hand the construction of what, when completed, will be one of the largest freight sorting depots in the world.

Since the war the port of Antwerp has forged rapidly ahead, until today it has more than regained the important position it occupied in 1914 as one of the premier ports of Europe. Ships of all nations line its acres of busy quays; heavy Flemish horses struggle alongside modern gasoline tractors and freight cars to cope with the unending stream of merchandise.

Additional new basins are now under construction together with a huge new ship canal, which, running parallel with the Scheldt, will allow the largest liners to enter the port by going up the Scheldt, and to leave by the canal, relieving much of the present congestion.

To cope with the "goods" or freight traffic, a complete new depot is being constructed near Antwerp, around the village of Eeckeren, which is ground formerly regained from the sea by the old system of retaining ramps and dykes.

General Plan of Depot

The general plan of the freight depot consists of a series of three railroad classification yards arranged in line, each successive stage being lower than the one before, so that the cars can be sorted and sent by gravity from one stage to another, avoiding to a large extent the use of shunting engines. The overall length of the depot will be about 3 miles.

Each classification yard or "sorting block" will consist of thirty sets of "parallel metals" or tracks with an overall length of about 1200 yards. Between each block there will be the usual "cross shunting connections" or switches, and, as already stated, the freight cars will go from one block to another by gravity.

Grading Operations

The project, as may well be imagined, requires very careful grading. There was available for material several of the old sand retaining walls, now no longer required. A start was made on these with hand labor and little 1-yard trucks, as illustrated. Two ¾-yard revolving shovels were then installed. These shovels have, in a remarkably short time, carried out the major portion of the grading, and in the process completely removed the old retaining walls.

Another illustration shows a view on the ground shortly after the first shovel had got to work. The photograph was taken from one bank, which, three months later, had completely disappeared. In the former view, the 1-yard trucks are still being used, but they were shortly afterwards succeeded by standard gauge 16-yard "freight wagons" and some good digging was done.

Excavation operations for Europe's largest freight yards near Antwerp, Belgium. One of two Bucyrus 20-B, ¾-yard shovels is shown starting operations. Note that the shovel is loading one-yard dump cars previously used in hand operations. These were later replaced by 16-yard cars. Note the old sea wall or dyke in the foreground. This was later removed by the shovels.

One of our views shows one of the machines standing up against its work, and another shows it discharging into "full gauge wagons." This latter picture gives a good idea of the extent of one of these classification yards. A great deal of the site shown by this view consisted of a large sand bank four months previously.

Digging conditions on these banks were particularly easy, and it was soon found that a

Beginning the excavation for the freight yards. This method was displaced by modern steam shovels with 16-yard cars.

1-cubic-yard or even a 1¼-cubic-yard dipper would be an advantage in place of the standard ¾-yard dipper. These shovels were Bucyrus 20-B steam machines mounted on caterpillars.

There were two factors which seriously hampered fast digging; when the shovels first started to work there were available only the small one-yard dump cars; later when 16-yard cars were

One of the shovels up against a good cut during a later phase of the operation.

obtained the shovels were often kept waiting for "empties." As it was, the 20-B's with ¾-cubic-yard dippers have averaged about 750 cubic yards per working day. One shovel runner has become very expert, and averages about four complete cycles per minute.

The fuel consumption was about 1200 pounds of briquetted coal per day. Hoist ropes were lasting about three and one-half months. The average day was nine working hours.

The grading for this job is almost completed, and the shovels are now in course of being removed to another large contract which De Moor Freres have obtained, that of opening the new coal field in the province of Limbourg, Belgium.

The Belgian operators take considerable pride in their machines and the efficiency of their operation. There is no doubt that if they were backed up with proper tipping wagons and good car spotting, they would turn out some astonishing output records.

These shovels with their quick motions and rapid swinging attract great interest wherever they are used in Belgium, as they present such a marked contrast to the ponderous movements of some others which may be seen at work there.

Messrs. De Moor Freres are to be congratulated on the effective and up-to-date methods they are adopting in Belgium.

Showing the extent of one of the freight classification yards. Bucyrus 20-B shovel in foreground, loading 16-yard cars.

Their foresight in obtaining two shovels for their Wilmarsdonck Depot has enabled them to make a splendid start on their large new project in Limbourg.

Don'ts for the Shovel or Dragline Operator

Don't permit loafing around the fireman while the shovel is working.

Don't do all the running yourself — break your men in for practical service.

Don't try to stop a good man from working himself up, if he looks worth while. He may prove a good find.

Don't get angry with the new cranesman. Good judgment and patience is better.

Don't show off while the superintendent or visitors are on the job. It doesn't pay.

Don't neglect to search for the cause of any unusual occurrence, noise, or knocking, and do not put off the remedy when the cause is found. Today's doctor may prevent tomorrow's disaster.

W. T. Taylor's 20-B Loading 1½-yard Eagle Wagons

J. J. McCarthy's 20-B Starting Operations at the Lower End of the Contract. Little Red Wagons are Serving the Shovel.

A Typical Section of the Right-of-Way

W. T. Taylor's Shovel Coming Down the Line Widening the Cut

J. J. McCarthy's 20-B in operation. It is served by seven 1½-yard

Building a Fill for a Bridge Approach

Construction of the Bee Line Highway, Jefferson County, Alabama

Reconstruction and Relocation of a Federal Aid Arterial Highway, Describing J. J. McCarthy's Contract Involving 187,600 Cubic Yards

OVER the rolling hills of Alabama, in Jefferson County, there stretches from Birmingham to Montgomery, an arterial highway so steep, and so crooked, that it has finally been decided to abandon the old route in many places, and construct a new road instead.

That section of the proposed road from Cahaba River Bridge to the top of Shades Mountain, in Jefferson County, a distance of 7 miles, is known as Federal Aid Project No. 147 of the new Bee Line Highway, the construction of which has been let to J. J. McCarthy and the Newell Construction Company, both well-known contractors of Birmingham, Alabama.

J. J. McCarthy will handle the excavation and grading, while the Newell Construction Company will do the surfacing.

J. J. McCarthy's shovel in a sand rock cut. A Gardner air compressor is shown to the right.

For a distance of about 4000 feet of this project, the new route follows the old road, and then lays off to the left toward Montgomery. On the new highway the maximum grade will in no place be over 6 per cent, and the sharpest curves never more than 8 degrees.

Work was started on this project on the tenth of last September, and it is expected that the grading will be completed early in the spring of 1925.

142,000 Yards of Common and 45,600 Yards of Rock Excavation

The J. J. McCarthy contract will involve an excavation of 142,000 cubic yards of common, and 45,600 cubic yards of solid rock.

Work is now under way at the lower end of the project in a cut of 20,000 cubic yards, most of which is sand rock.

This cut is being drilled with Waugh Clipper drills, and shot with 20 per cent dynamite. Air for these drills is furnished by a Gardner compressor capable of delivering 90 cubic feet of air

The Gardner air compressor with Fordson tractor drive furnishing air for Waugh Clipper drills in the sand rock cut for the lower end of the job.

per minute. This compressor is driven by a Fordson tractor.

Excavation is also under way about the middle of the job, but the cuts are not so deep, and it is not necessary to shoot the shale.

The Shovel Crews. To the left, J. A. Trawick, fireman, and John Roberts, operator of W. T. Taylor's 20-B. The right-hand view reading from left to right, Fred Bradshaw, operator of J. J. McCarthy's Bucyrus, Homer Israel, fireman. Robert, son of Mr. McCarthy and Homer Milstead, helper.

Excavation Done by ¾-yard Shovels Mounted on Caterpillars

Mr. McCarthy is using his Bucyrus 20-B shovel in the rock cut at the lower end of the job. The machine at the middle of the job is also a 20-B rented from the W. F. Taylor Construction Co., of Birmingham.

(Continued on Page 98)

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1925 Railroad Construction Prospects

From present indications we are led to make the prediction that when the 1925 construction season opens, many a railroad contractor will be scraping grease off his equipment which has for so many years been sidetracked, awaiting the long-expected revival in railroad construction.

Press reports indicate that railroads all over the United States are preparing for huge expansions during the year 1925. E. H. MacGovern, president of the Florida and East Coast Railroad, has recently been quoted as saying:

"Most of the railroads of the country are planning and preparing an extensive expansion program for 1925. I wouldn't be surprised if more than 20,000 miles of track, mostly new, will be laid during this year.

"This is remarkable, because not since the start of the world war in 1914 has there been more than 10,000 miles of railroad track laid.

"I believe that the coming winter will be one of the most prosperous on record for both passenger and freight carrying."

The Railway Age estimates that in 1925 the railways of the United States and Canada will expend for additions and betterments to their plant the sum of $1,350,000,000 — 15 or 20 per cent more than in any previous year in railway history.

Practical evidence that the 1925 capital expenditure program is under way may be seen from the following, which are but a few of the projects either already begun or announced as contemplated in the near future.

Canadian Pacific, jointly with *Canadian National,* is considering proposal of the Canadian Government to build a railway line into the Peace River region of Alberta and British Columbia; decision expected momentarily.

Chicago & Western Indiana expects to spend $3,000,000 to $4,000,000 in 1925 on grade crossing elimination work in Chicago.

Denver & Salt Lake Western, a subsidiary of Denver & Salt Lake, has applied to Interstate Commerce Commission for a certificate authorizing construction of line from Orestod, Colorado, to Dotsero, 41 miles, which will shorten the present distance between Salt Lake City and Denver by 173 miles.

Houston & Texas Central, subsidiary of Southern Pacific, has been authorized by Interstate Commerce Commission to construct extension of so-called Dallas Loop, additional cost $1,238,000. Construction to be started at once and completed by October 1.

New York Central has applied for order directing elimination of a number of grade crossings in Yonkers, New York, and in Hastings.

Pennsylvania has been authorized by Interstate Commerce Commission to build a 5-mile extension to Norfolk, Virginia, to cost $3,299,740; contract for two bridges to cost $1,500,000 has been awarded.

Southern reported making surveys for proposed cut-off, Danville, Kentucky, to Jellico, Tennessee, 125 miles, to cost over $10,000,000.

Southern Pacific awarded contract for grading of 50 miles new main line Picacho, Arizona, to Chandler, part of project for new lines in Arizona.

These plans for expansion on the part of the railroads of the country seem to be quite in keeping with the optimism shown by other fundamental industries in regard to the business outlook of the coming year.

Construction of the Bee Line Highway, Jefferson County, Ala.
(Continued from Page 97)

Both of these shovels are standard 20-B steam shovels, equipped with ¾-yard dippers, and mounted on caterpillars.

Seven 1½-yard Watson wagons serve the McCarthy machine on short hauls, while 1½-yard Eagle wagons are used with the Taylor shovel.

A 20-mule wheeler outfit is also being used on some of the lighter cuts.

On account of an exceptionally dry fall it has been necessary to haul water for both of these shovels, but coal is conveniently handled from nearby sidings. The water is being hauled in 500-gallon tank wagons.

Organization

Fred Bradshaw is operating the J. J. McCarthy shovel, while John Roberts pilots the W. T. Taylor machine — both of whom can be depended upon to keep the dirt moving.

J. W. Walker and W. A. Glass are dump foremen, and "Dad" Weber handles the powder.

· FIELD NOTES ·

It is our intention to publish on this page in future issues of our paper a series of articles dealing with the maintenance and upkeep of excavating machinery. We invite from our readers suggestions and short articles covering this subject, with short-cuts, labor-saving methods and various kinks used by shovel and dragline operators which result in a saving of time and operating expense.

Priming and Foaming

Priming consists of water caught up and carried with the flow of steam out of a boiler into the steam pipes and engine cylinder. It may thus lead to serious breakdown of the engines from accumulation of water in the cylinders.

Priming may occur in all classes of boilers, but the liability to priming is greatest in those boilers which have small steam spaces, or water surfaces.

The working conditions which are calculated to cause priming are:

An overworked boiler, or heavy and sudden demands for steam, sufficient to cause rapid lowering of pressure, as in steam shovel and locomotive boilers; dirty, or greasy feed water, or an excess of soda; too high water level.

To prevent priming, or to prevent it as far as practical when a boiler is overworked, the water should be good, grease should be excluded, no excess of soda or compositions containing soda should be used, and the water should not be allowed to get too high, or to fluctuate unduly. The shovel's throttle valve should be opened gradually, as far as this is possible in operation.

Some steam shovel manufacturers are prepared to furnish baffle plates, which are designed for the dome of a locomotive-type boiler, so arranged that the steam is forced to make a long crooked circuit before leaving the dome, which gives the water time to drop back into the boiler before it gets into the steam pipes.

This installation is considerably cheaper than a steam separator of the receiver type, which is sometimes used to prevent priming.

Sometimes there are chemicals in water that cause foaming, and then, as in the case of scale, it is well to have a competent chemist analyze the water and prescribe accordingly.

It is quite a common practice to use crude oil to prevent foaming, but there are experienced men who much prefer castor oil. Castor oil is said to be much more effective, and is not so likely to damage the boiler. The amount of castor oil should be about one tablespoonful per hour.

Where foaming is a constant occurrence, it is well to feed the castor oil to the boiler with a pump, in the same way, for instance, as oil may be pumped to an engine cylinder.

When immediate measures are necessary to stop priming, partially closing the steam stop valve, and lowering the water level by blowing down one or two inches, if the water be too high or it be dirty, will be more or less effective.

Method of Digging Pipe Trench in Wet Ground

The Standard Steel Car Company of Hammond, Indiana, were recently presented with the problem of digging a pipe trench in a wet and sandy soil where the ground water was within three feet of the surface.

At the suggestion of Mr. Higgins, their plant engineer, well points were driven along on the left side to a depth slightly below the proposed bottom of the trench. These well points were spaced about 6 feet apart and connected with rubber hose to a 4-inch surface pipe.

Digging a pipe trench through wet ground. Note well points driven along left side of trench.

A 7 x 10-inch motor-driven triplex pump connected to the surface pipe kept this trench perfectly dry for a distance of 400 feet, thus enabling work to proceed without the usual expensive bracing and pumping on a job of this character.

This description has been obtained through the courtesy of the Factory Mutual Record of Boston.

SHOTS FROM THE · FIRING LINE ·

Central States Notes

BY M. J. WOODHULL

C. R. Owens writes that as soon as spring opens he will be operating a Class-24 Bucyrus dragline for McCree & Co. at Mason City, Iowa.

W. H. Warner's 320-B Bucyrus is being erected at Toronto, Ohio, and it won't be long until they will start loading coal for the power plant. The power plant will consume 1000 tons of coal a day.

"Dutch" Ziegenhagael is operating a 50-B Bucyrus steam shovel for John Marsch, Inc., on the Illinois Central cut-off job at Gayle, Illinois.

James H. Corbett Co., who has the excavation job on the Welland Canal, purchased a Bucyrus Class-175 electric dragline. The work consists of earth and rock excavation running 3500 feet in length and 230 feet wide. Mr. Corbett has also purchased ten 30-yard cars and new locomotives.

Charlie Flynn of the Tice-Flynn Coal Co. has been handling the levers of his 80-B Bucyrus for a few shifts. Charlie said it came natural after being away from it for ten years. Tice-Flynn Co. are loading out nice tonnage every day.

Maryland Notes

A. L. Peterson is operating a 70-ton Bucyrus shovel for the Vang Construction Company at Cumberland, Maryland. Paul McCabe is craning and Warren Kasecamp is doing the firing.

Minnesota Notes

The M. A. Hanna Company is dismantling their 225-B Bucyrus electric shovel, which has recently been used as a dragline for stripping the Larue Mine of Nashwauk, Minnesota. This machine will be shipped to Buhl, and used as a dragline for stripping the Shiras Mine recently taken over from the Oliver Company. This mine joins the Wagebon Mine on the east, with which it will be combined, and will be the only pit on the range that is completely electrified.

Tony J. Lackner of Chisholm, Minnesota, is firing a Bucyrus shovel for the Oliver Iron Mining Co.

Northwestern States Notes

BY A. R. HANCE, PORTLAND, OREGON

Four bids were opened recently at American Falls, Idaho, for the construction of the big reservoir dam. The Utah Construction Company of Salt Lake City was low bidder on the project with $1,281,000. Guy F. Atkinson, Portland contractor, was second low bidder with $1,319,000. A great quantity of material will be used in the construction of the big container, 179,000 cubic yards of concrete and 2,376,000 pounds of reinforcing steel being necessary. The project will have a storage capacity of 1,040,000 acre feet.

Southern States News

BY C. N. BALLENTINE AND W. W. WHORLEY, BIRMINGHAM

The L. E. Myers Company of Chicago is making rapid progress on the hydro-electric project at Dix Dam, Kentucky.

M. H. Hudson is handling a Bucyrus 78-C on caterpillars; Jimmy Starks is craning for him.

Frank Loulan, another old-timer, is loading rock with a 78-C caterpillar Bucyrus; C. D. (Danny) Hutton is riding the boom.

J. R. Castleberry, who hails from New York City, is piloting a 50-B Bucyrus through a rock cut.

W. H. Brock is running a Bucyrus 20-B.

S. B. Bush, who has been in the Knoxville District for some time, was a recent visitor in Birmingham. Anyone desiring a good whirley man can reach him at 621 N. 23rd Street, Birmingham, Alabama.

J. C. Byram & Company of Birmingham were successful bidders on a nice railroad grading job for the Sloss-Sheffield Company at Flat Top, Alabama.

A. A. Robinson is loading gravel with a Bucyrus Class-24 dragline for the Alabama Sand & Gravel Company at Montgomery, Alabama.

W. D. Lisenbee, who has been handling a 225-B Bucyrus for Hawley-McIsaac in the Kentucky coal fields, is now piloting an 18-B up a wild stretch of country along the Cheoah River near Tapoca, North Carolina.

E. P. Russell, superintendent in charge of State Highway forces near Monteagle, Tennessee, reports that they have finished up the road into Sequatchie Valley and will begin work shortly on a new line towards Manchester.

W. T. Goodwin, who has been running a Bucyrus 70-C for Brooks-Callaway near Gold Ridge, Alabama, dropped in to see us recently.

A. L. Dickson is operating a Bucyrus Class-24 Dragline for Brooks-Callaway, at Opelika, Alabama.

St. Louis Items

BY A. B. KOENIG

The Industrial Track Construction Co. moved their offices from the Granite Building to the Title Guaranty Building here. They have one of the most up-to-date contractors' offices in the city.

Luther S. Oakes, president of Winston Bros. Co., Minneapolis, stopped off here for a little while on his way South. Oakes informs us that his Company are building a number of railroads in Columbia, South America, employing a large number of natives.

Joe Ballinger, Blue Grass Hotel, St. Louis, has a whirley shovel idle.

The largest waterworks contract ever let by the city was signed and approved by the Board of Public Service for the construction of the water mains from the new water plant at Howard's Bend, St. Louis County, on the Missouri River, to Kings Highway Boulevard and Oakland Avenue, a distance of approximately sixteen miles. The contract was awarded to Bill Hays, Inc., Detroit, Michigan, for $1,800,494.

E. A. Clark, president of the Subway Engineering Co., 115 South Dearborn Street, Chicago, writes us that they are in the market for tunnel, shaft or reservoir work. They have outfits idle that they can place on work immediately.

The Halpin-Boyle Construction Co. was awarded contract for grading 63rd Street between Troost Avenue and Swope Park, Kansas City, Missouri. The street will be widened to 80 feet by adding 20 feet to the south side. Contract price $40,873.04.

N. L. Fowler of Maloy & Fowler stopped off here on his way back to St. Paul from Hot Springs, Arkansas. They have completed their work on the Burlington Railroad at Astoria, Illinois.

James T. Addis Contracting Co., 1500 Central National Bank Building, St. Louis, Missouri, have a shovel outfit idle.

W. A. Ross was awarded contract for paving 27 miles of State Highway No. 2 in Lafayette County, Missouri.

Pat McCarthy, formerly Dunn & McCarthy, now the McCarthy Improvement Co., Davenport, Iowa, attended the National Brick Makers convention here January 20th to 23rd.

Construction work on the new Kansas City-St. Louis Short Line Electric Railway is expected to begin shortly, and right-of-way has been secured through ten counties the road proposes to traverse.

W. L. Killebrew, on old-time levee and government contractor, died here on January 16th. He is survived by his wife and several children.

The B. W. Construction Co. of Chicago were awarded contract for constructing the new Sears-Roebuck plant in Kansas City. Norton Bros. are doing the grading and excavating on this job.

D. S. Wood, Rantoul, Illinois, reports a 7-team outfit idle there. He will either contract or work teams by day.

C. R. Cummins Co. have made a good start on their big drainage contract in Southern Missouri.

The H. C. Spinks Clay Co., Newport, Kentucky, have a shovel and dump wagon outfit idle near Paris, Tennessee. They would like to place this outfit on some work in Western Tennessee or Kentucky.

Jim Joyce of the Cameron Joyce Steam Shovel Co. came in from Keokuk, Iowa, for some labor and supplies for their new Illinois Central work.

C. C. Barnes and Jim O'Neil were with us a day. They report their team work on the Illinois Central Railroad in Illinois as getting along nicely, and opened another camp the other day.

John Dooling has his outfit laid up in Denver, Colorado, for the winter. He is visiting friends in East St. Louis.

Rouse Construction Co., Cape Girardeau, Missouri, are looking for a commissary company to put in a boarding camp for 75 men on their highway work near Cape Girardeau.

Tom Blythe of Shugart & Blythe was in the city the other day. He reports their Illinois Central work getting along nicely. Among the contractors that have outfits on their work are: Longerbone & Paquette; Peed Bros.; O. Christenson; J. B. Dorris; C. C. Barnes Co.; and James O'Neil. Tom told the writer that he would send the names of the balance of contractors they have on the line, but up to this writing this information has not been received.

John Marsch has three good steam shovel outfits at work on his new Illinois Central job in Illinois. Things are humming over his way.

S. W. Carr and E. W. Engle of the J. J. Grier Co. spent a day in the city renewing old acquaintances and making new ones.

R. G. Flaugher & Co., Urbana, Illinois, can use a grade outfit on 10 or 12 miles of highway that they are going to pave in Illinois.

Ivan L. Wolfe is operating an 18-B Bucyrus shovel at St. Louis.

C. E. Pinney is operating a Marion Model 75 for the Alpha Cement Company at St. Louis.

Canada

Toronto and Vicinity

BY M. DE WIND

Messrs. Jas. Corbett & Sons, Pittsburgh, are busy with preparations for their work on the Welland Canal. Mr. Herman Corbett and Mr. Sims, chief engineer, were recent visitors to Welland where the firm is establishing their office. They have purchased a Bucyrus Class-175 electric dragline for this work.

The Lumsden Engineering & Transport Co. are assembling their plant for work on their earth-moving subcontract near Welland in the ship canal. Mr. L. Cummings, the president, and Mr. Richardson, the engineer, are busy at their headquarters here.

Mr. George MacNamara of the MacNamara Construction Co., Soo, Ontario, was a recent visitor to Toronto. He looks forward to a good season for the contractors in the north country.

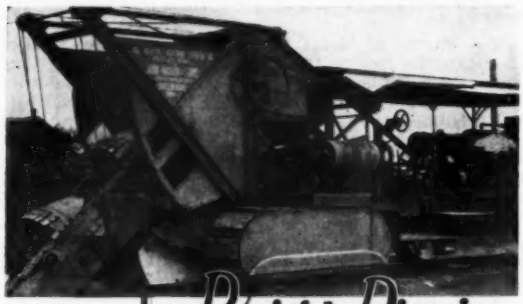
Recent visitors at Mussens Limited, Toronto, were Mr. John Beck of the Western Wheeled Scraper Co. and Mr. Frank Smith of the Bucyrus Co. It is a tonic to a Canadian equipment man, emerging from a winter of icy inactivity, to hear these men talk of the December to February rush of construction work to the south of us.

The sewer work of the Dominion Construction Co., Limited, of Toronto, in Scarboro Township, has made steady progress all winter. We all have a duty to perform in everlastingly impressing on our public boards how much of this work can be done to advantage through our winter cold weather.

By the time this appears in print the annual meeting of the Ontario County and Township officials at the end of February will be an accomplished fact. Everyone is anxiously awaiting the Ontario Highway Department's announcement of the spring road-building program.

Albert Bishop is craning a steam shovel for Fraser & Brace, at Herbertville Village, Lac St. Jean, Quebec.

BUILDERS OF TRENCH EXCAVATORS FOR 30 YEARS



Buckeye Positive Digging with Safety

GEARS and chains transmit power on Buckeyes. No slippage—an automatic safety device protects against overloads. All power is profitably used.

Another positive feature that appeals to all contractors is the Quick-Shift Conveyor, originally developed and perfected on Buckeyes. This conveyor is driven from both ends. It has an exceptionally wide belt which is kept centered by a patented construction. No material too wet, too slippery or too difficult to handle with a Buckeye Conveyor.

Buckeye ingenuity, plus thirty years' experience, provides the safety feature that insures continuous, profitable performance.

Ask any owner.

Get the Facts

"We've owned seven Buckeyes," say Herr Bros., Piper City, Illinois, "and have always had more work from these machines than they were guaranteed to do."

See why it is that Buckeye owners are so enthusiastic about their machines. Get the facts on the practical operating conveniences and big range of cutting widths offered only by Buckeyes.

If you're near an owner, ask him. Or, send for descriptive booklets.

The Buckeye Traction Ditcher Company
Findlay, Ohio

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types), Pipe-Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers.

THERE'S A BUCKEYE SALES AND SERVICE OFFICE NEAR YOU

Vancouver and Vicinity

BY J. C. MOON

Construction of a line of railway into the Peace River District from some point on the Canadian National Railway east of Brule Lake will furnish the solution of the Peace River country's transportation problem according to Premier John Oliver, who recently returned from Ottawa, and surveys will be made by the Government this season, with a view to determining the best route.

Mining conditions in British Columbia appear to be brighter than for some time past, and considerable development work is looked for in the Portland Canal District, whilst there are indications of great activity in placer gold mining in the Cassiar District as soon as the season opens.

With the arrival of better weather conditions the contractors for the new Transprovincial Highway, the A. B. Palmer Co., Ltd., and W. P. Tierney Company are completing their preparations for making a real start on the work. Already several camps have been opened and in a short time this work will be in full swing.

Winnipeg and Vicinity

BY F. X. AMOSS

Canadian National Railways Branch Line work amounted in 1924 to approximately $1,500,000. The work proposed for 1925 will be in excess of $8,000,000, but Parliamentary approval has not as yet been given.

Mr. S. R. Henderson has been elected "Good Roads" President in Manitoba for the sixteenth successive term. At a meeting of the Manitoba Good Roads Association held recently a motion was passed expressing the commendation of the Provincial Government's policy in regard to the control of trunk highways and in connection with the gravelling of the Lord Selkirk Highway.

Mr. Charles Hooper is rebuilding the Stovel Block, Winnipeg, partially destroyed this year by fire.

Residents of Winnipeg are confidently expecting that work will be started on the Mall this summer. As soon as it is definitely under way we understand that the Hudson Bay Company will start the erection of their $5,000,000 departmental store.

TRADE NOTES

The Pyle National Company, manufacturers of Turbo-Generators, have recently added to their products a complete line of new flood lights.

These Pyle-O-Lytes, as they are called, are made of a case alloy of aluminum, which resists the destructive action of the elements. All pins, latches, etc., are made of bronze or brass for the same reason. The glass reflectors used are guaranteed against defects of workmanship or material for three years. A large number of these Pyle-O-Lytes have been sold to contractors for use on steam shovels, draglines, etc.

The lights are described in *The Pyle-National Company's* No. 4 PYLE-O-LYTE CATALOG. Copies may be had on request by addressing *The Pyle-National Company, Chicago, Illinois.*

The Chicago Pneumatic Tool Company announces the opening of a branch office in Mexico at 1A San Juan de Letram, 15 Mexico City, D. F.

For convenience in making inquiry use postal inserted in this number.

The Geo. D. Whitcomb Company, Rochelle, Illinois, manufacturers of gasoline, storage battery, trolley, and combined trolley and storage battery locomotives, has just issued a new bulletin covering the subject of Seven-Ton Positive Gear-Driven Gasoline Locomotives.

This BULLETIN No. 2512 discusses in detail the power unit, clutch, transmission, and construction of Seven-Ton Gasoline Locomotives and their uses, and will be sent upon request to all interested parties.

The Western Wheeled Scraper Company have recently announced their new GENERAL CATALOG No. 60. This publication should prove of great value to the contractor; it is fully descriptive of the company's wide and well-known line. It is profusely illustrated and gives complete specifications of dump cars (from 4 to 45 cubic yards), flat cars, spreaders, dump carts, graders, plows, scrapers, dump wagons, rock crushers, portable gravel screening plants and graders.

A copy of this publication may be had on request to the *Western Wheeled Scraper Co., Aurora, Illinios.*

Mr. R. B. Randall, who for approximately six years was Western Sales Manager of Blaw-Knox Company, has been appointed Western Sales Manager of the G. H. Williams Company, manufacturers of clamshell buckets, Erie, Pennsylvania, with headquarters in Chicago. Mr. Randall is very well known to contractors and engineers, especially in the Middle West, and his many years of experience with clamshell bucket work have equipped him to render valuable service to bucket users.

The Barber-Greene Company announces that Mr. A. G. Ford, formerly of the Western United Gas & Electric Company, has joined their forces as a field engineer. Mr. Ford will devote his time to the sale and application of Barber-Greene Ditchers.

In Lima, Ohio, for the purpose of manufacturing motor trucks and busses, there has been organized the Gramm and Kincaid Motors, Incorporated. Active in this new concern are to be Messrs. B. A. Gramm and R. M. Kincaid. Mr. Gramm, president and chairman of the board of directors, has been connected with the industry since 1901, and has built motor trucks continuously since 1906. Mr. Kincaid, recently vice-president and general manager of the Garford Motor Truck Co., and for the last ten years actively engaged in automotive work, is vice-president and treasurer.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

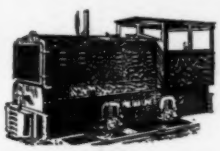
CONTRACTING WITH BARBER-GREENES — 4½ x 10½ inches, 24 pages, with cover. Gives illustrations and general information on typical jobs to show the flexibility, economy and adaptability of Barber-Greene equipment to the everyday problems of the contractor, together with useful suggestions for handling material. For your copy write *Barber-Greene Co., 620 West Park Avenue, Aurora, Illinois.*

GILMAN MOUNTED ROCK DRILLS — 6 x 9 inches, 32 pages. Various sizes of these drills are described, illustrated and specifications given. There is also included illustrations of other applications in general contracting, the quarry and the mine. For copy address *Gilman Manufacturing Company, East Boston, Massachusetts.*

STROUD "LITTLE RED"

The Little Red Wagon Mfg. Co.
Omaha, Nebraska

MILWAUKEE
Gasoline Locomotives



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Write for Catalogs P-129 and P-136.

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DIGGING CLAMSHELLS

Mud, muck and boulders all look alike to the Dreadnaught — and the sight of one of these husky clamshells working is convincing evidence that Blaw-Knox Buckets "have the guts."

If you have a digging job or a material handling job —

We Have the Bucket!

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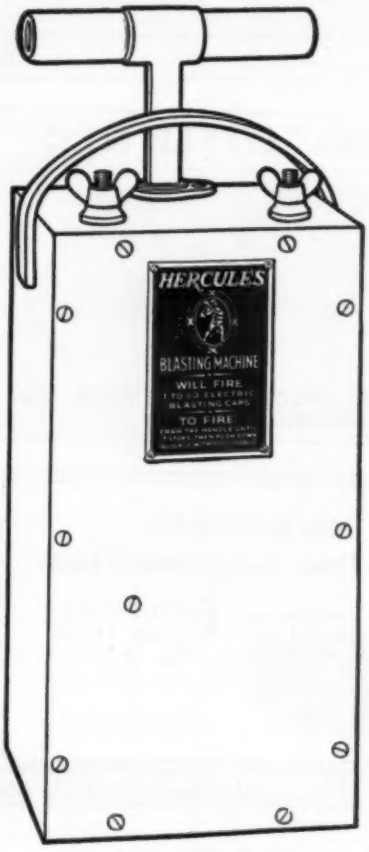
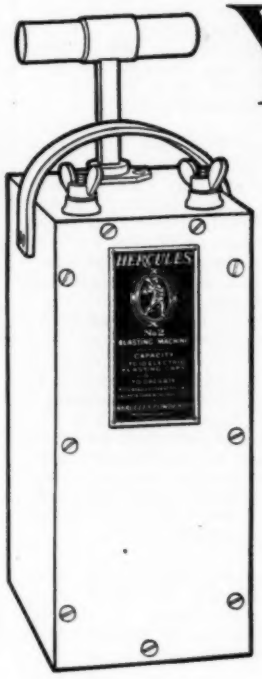
633 Farmer's Bank Building
Pittsburgh, Pa.

BLAW-KNOX

Select Your Size



HERCULES
One-to-fifty-cap capacity
Weighs about 23 lbs.



HERCULES No. 2
One-to-ten-cap capacity
Weighs about 9 lbs.

HERCULES MIDGET
One-to-five-cap capacity
Weighs about 3 lbs.

Hercules [*one-to-fifty-cap capacity*]

This improved blasting machine, which weighs about three pounds less than old models rated to fire thirty caps, has fired in tests many more than fifty caps. However, we do not recommend connecting over fifty electric blasting caps in one series under proper working conditions. The *Hercules*, therefore, has a large power reserve when firing at its highest rated capacity.

Hercules No. 2 [*one-to-ten-cap capacity*]

This is a smaller and lighter machine. It also has a high power reserve above its maximum rated capacity of ten electric blasting caps.

Hercules Midget

Pocket-size—and can be carried conveniently in the hand or suspended by a shoulder strap. Just right for coal mines. Its rated capacity of one to five caps allows ample power reserve.

Write to our advertising department, 987 King Street, Wilmington, Delaware, for a free copy of *Shot Firing by Electricity*.

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No Ordinary Name

The name on a truck will not do that truck's work. But it will tell you a great deal about the kind of work you can expect the truck to do.

The GMC name, for instance, identifies a truck that will do hard work, better — and longer.

It identifies advanced features of truck design that cut operating costs for GMC owners.

It also points to the resources of General Motors behind this truck; economical purchasing, experimental laboratories, truck building experience accumulated since the very beginning of the industry, and, above all, the supreme care that guards the quality and efficiency of every General Motors product.

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General Motors Trucks

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Division of General Motors Corporation
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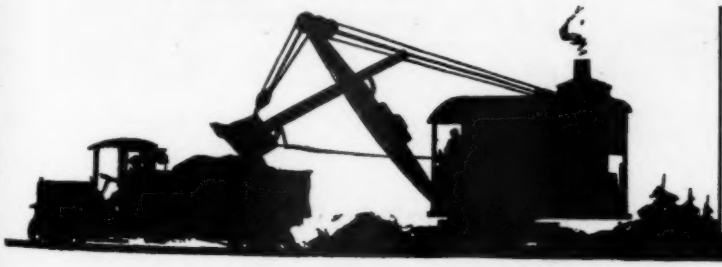

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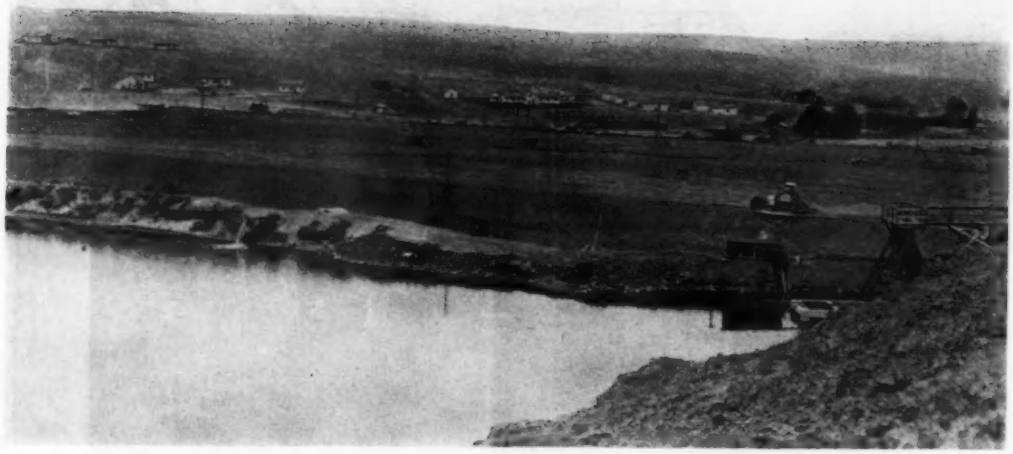

A general view of McKay Dam under construction. This dam when completed will contain approximately 2,400,000 cubic yards of gravel.

One of the two Bucyrus 80-B electric shovels loading gravel from the river bed above the dam. Note the water in the pit; the machines work continuously in water from 6 inches to 2 feet deep.

United States Bureau of Reclamation Work on the McKay Dam, Oregon